

Application No. 10/574,859
Responsive to Office Action dated October 1, 2008
Paper Dated March 2, 2009
Attorney Docket No. 4042-060816

REMARKS

This is in response to the Office Action dated October 1, 2008, in which the only asserted rejection is one of purported anticipation of claims 1-28 by WO 03/0664502 A2. By way of the claim amendments submitted herewith and the Declaration of Dr. Robin R. Oder and Mr. Russell Jamison establishing new and unexpected results with the claimed invention *vis a vis* WO 03/0664502 A2, entry of both of which is respectfully requested, all of claims 1-10 and 12-28 are in condition for immediate allowance. The undersigned would very much appreciate a telephone call to schedule a discussion of the claims and the invention directly with the inventors, Dr. Robin R. Oder and Mr. Russell Jamison, after the Examiner has had a chance to review this Amendment and the accompanying Declaration and if such discussion is necessary prior to allowance.

Prior art PCT Publication WO 03/064052 A2 contains a vertically oriented separation chamber with an outlet on the top and underflow on the bottom and an entrance port located somewhere between the underflow and the overflow. The separation chamber disclosed in this prior art reference contains within it at least one vertically oriented rod which can be made from permanent magnet material or magnetized by an external magnet. In no case is the separation chamber ever configured without one or more magnetic or magnetizable rods therein. Also, unlike the present claimed invention, the inlet of WO 03/064052 allows slurry to enter generally near the bottom of the separation chamber and the separated slurry exits near the top of the chamber. (The Examiner will note that although the Office Action refers to the prior art reference's purportedly disclosing first and second inlet ports (on page 2, lines 9-11 of the Office Action), in fact the only reference to first and second inlet ports is in the present specification and not in the Oder et al. cited prior art.) In the amended claim 1, by contrast, at least one inlet pipe is within the separation chamber and adjacent the top of the chamber, while the overflow port is at the top of the chamber.

Therefore, unlike the cited reference summarized above, the separation chamber of the instant invention contains no rods, and there are no magnetic elements built inside the separation chamber at all. Amendatory language taken from the specification paragraph 10 recites, "a magnet having a first pole and a second pole positioned adjacent to the exterior wall of the separation chamber and with no magnetic elements built inside said separation chamber," to make even more particular the absence of

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built magnetic elements from the inside of the separation chamber. Additional amendatory language, “and further adapted to sweep the mixture downward along the interior wall toward the bottom portion of the separation chamber” may be found, for example, in original claim 25. Support for “inlet pipe within said separation chamber” is found in specification paragraph 10, which reads, the “separation chamber is empty except for the non-magnetic inlet pipes and the slurry contained therein.” That the overflow port is at the top of the separation chamber as now claimed is supported in the original specification at, for example, paragraph 51, Example 1, which explains “[t]he overall canister length was 21 inches from the top of the dome at the overflow port.” The position of the at least one inlet pipe adjacent the top of the separation chamber is apparent from, for example, the present Figures 1 and 2. By definition and logic, therefore, the inlet pipe or pipes extend below the overflow port but enter from or adjacent the same end of the chamber as contains the overflow port. The new claim language in claim 3 has been taken from original claim 11, canceled herewith.

Particularly in view of the claims amended herewith, it is now apparent that WO 03/064052 A2 is unable to teach or suggest, let alone to anticipate, the present invention as claimed. In WO 03/064052 A2 the magnetic particles migrate to, adhere to and travel along the surface of the vertical rod or rods and—problematically although not discussed in the prior art reference per se—tend to create plugging at the underflow port. The development of the separation chamber having no magnetic elements built therein was counterintuitive (as evidenced by the accompanying Declaration of Dr. Oder and Mr. Jamison) and led to new and unexpected results as contrasted with the rods-containing separation chamber of the prior art, as explained in the accompanying Declaration cited as follows.

That Dr. Oder and Mr. Jamison are acknowledged experts in the field of magnetic separation is apparent from their having worked together for over twenty years and by their summary biographies which appear in Paragraphs 1 and 2 of the accompanying Declaration of Dr. Robin R. Oder and Mr. Russell E. Jamison.

At the time of the present invention, it was counterintuitive to one skilled in the art to regard the subject matter of WO 03/064052 and to think of removing the magnetic rods from inside the separation chamber. As the inventors state in their Declaration Paragraph 2, “At the time we developed the improvements embodied and claimed in Published U.S. Application No. 20070056912, it was

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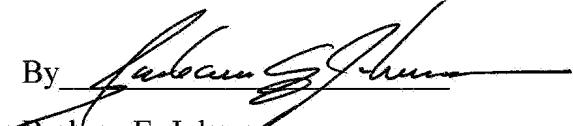
counterintuitive to take the apparatus of WO 03/064052 A2 and to try to improve it by, among other modifications, removing the magnetic rods from inside the chamber.” The inventors proceed to explain in the Declaration, Paragraph 3, that “We believed and others skilled in the art would likewise have believed that to remove the magnetic rods from the separation chamber of the WO 03/064052 device would not have improved the separator because the magnetic rods created the particle capture force to counteract and to overcome the slurry flow that would otherwise engulf the particles and prevent their separation.” After redesigning the separation apparatus of WO 03/064052 in ways described in detail in the Declaration Paragraph 3, each of which recitations also appears in amended claim 1 above, the inventors concluded that the redesigned apparatus gave new and unexpectedly improved results, set forth in Paragraphs 4 and 5 of the Declaration.

According to the Declaration Paragraph 4, the present claimed apparatus gave “much better product throughput compared with the WO 03/064052 apparatus,” in tests summarized and reported. In particular, the inventors conclude that based on the tests “product throughput for the claimed apparatus proceeded at the rate of on the order of 7 gpm/Ft² (gallons per minute per Square Foot of chamber cross-section)...whereas the throughput rate in the chamber of an apparatus according to WO 03/064052 could not exceed 3 gpm/SqFt of chamber cross-section...without malfunction or unsatisfactory separation” (Declaration Paragraph 4). In addition, the claimed apparatus was less likely to plug, in contrast to the apparatus of WO 03/064052 (Declaration Paragraph 5). Based on comparative tests run by the inventors and reported in the accompanying Declaration, therefore, not only do the claims as amended herewith clearly define over WO 03/064052 but the new and unexpected results attained with the claimed apparatus show that the claims are also nonobvious over WO 03/064052.

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If any additional issue or matter remains for resolution prior to the Examiners' issuance of a Notice of Allowance, the undersigned would very much appreciate a telephone call at the telephone number listed below to schedule the requested interview among the Examiner, the undersigned, Dr. Oder and Mr. Jamison. Please note that although an unsigned copy of the accompanying Declaration is being filed herewith, both Declarants have already ratified the Declaration and a signed copy will follow in due course.

Respectfully submitted,
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